Name: Date:

Polynomial Factoring solution (version 634)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 44 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(44)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 176}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-112}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 7}}{2}$$

$$x = \frac{8 \pm 4\sqrt{7}\, i}{2}$$

$$x = 4 \pm 2\sqrt{7}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 6i$ and $-4 - 5i$ in standard form $(a + bi)$.**

Solution

$$(2 - 6i) \cdot (-4 - 5i)$$

$$-8 - 10i + 24i + 30i^2$$

$$-8 - 10i + 24i - 30$$

$$-8 - 30 - 10i + 24i$$

$$-38 + 14i$$

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3. **Write function $f(x) = x^3 - 10x^2 + 31x - 30$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	-10	31	-30
5		5	-25	30
	1	-5	6	0

$$f(x) = (x-5)(x^2 - 5x + 6)$$

$$f(x) = (x-5)(x-2)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+8) \cdot (x+3) \cdot (x-2)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.